Thomas Jefferson National Accelerator Facility
Integrated Safety Management System Program Description

Revision 0: September 5, 1997

Revision 1: October 23, 1997

Revision 2: April 28, 1998

Revision 3: October 4, 1999

Revision 4: September 11, 2000

Revision 5: September 30, 2001

Revision 6: December 30, 2002

Revision 7: November 30, 2003

Revision 8: November 30, 2004

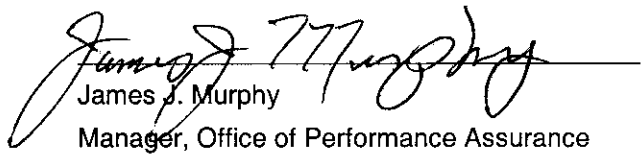
Revision 9: December 15, 2005

Table of Contents

Revision and Approval

The Thomas Jefferson National Accelerator Facility Integrated Safety Management System Program Description (TJNAF ISMS Program Description, Revision 9 (December 23, 2005) is effective upon approval and issuance. It supercedes and replaces the previous TJNAF ISMS Plan, Revision 8, dated November 30, 2004.

Submitted



James J. Murphy
Manager, Office of Performance Assurance

Approved by TJNAF Director's Council January 12, 2006.

(Director's Council's original approval signatures are on file in the Office of Performance Assurance.)

Thomas Jefferson National Accelerator Facility
Integrated Safety Management System (ISMS) Program Description

I. Executive Summary

Since Thomas Jefferson National Accelerator Facility (Jefferson Lab) became a Federally Funded Research and Development Center in Fiscal Year 1984, laboratory management has had the philosophy that environment, safety, and health must be an integral part of the work in order to be effective. A system which institutionalizes this philosophy has evolved and been continuously improved since that time. In parallel, the prudence of this approach has been recognized as a best practice by industry, and was finalized as a DOE Acquisition Regulation on June 27, 1997.[1,2] The requirements in this rule are substantially equivalent to those in the corresponding DOE Policy.[3] The similarity between the new requirement and the system already adopted by Jefferson Lab is so extensive that only four changes to Jefferson Lab's existing system were required by the new requirement: one involved augmentation of the information reporting system, one was the writing of this plan, and two involved flow-down of the new requirement to subcontracts.

Several changes were implemented or initiated in 2005 including:

- A centralized EH&S organization led by an Associate Director
- CATS, the Lab's Corrective Action Tracking System
- An Environmental Management System (EMS)
- Assessment process improvements[4]
- Independent assessments of several key areas (e.g. lasers, electrical safety)
- Formation of a Director's Safety Council
- Formation of a Workers Safety Committee to provide the Lab Director direct worker feedback
- Formation of a Senior Safety Advisory Committee

All these together were put in place for continuous improvement and further implementation of ISMS.

The format that has been adopted for writing this plan uses italicized phrases from the Integration clause,[1,2] verbatim, each followed by an explanation of the primary documents[4] and other methods Jefferson Lab uses to meet the requirements of the phrase. This approach has been adopted because (1) it provides a convenient road-map of Jefferson Lab's system to new employees, users, visitors, regulators, and other interested parties, and (2) it provides a convenient road-map to anyone trying to understand the correspondence between Jefferson Lab's system and the requirements of the Integration

[1] Department of Energy Acquisition Regulation 48 CFR 970.5204-2.

[2] Federal Register, June 27, 1997 (Volume 62, Number 124), page 34841.

[3] DOE P 450.4, dated October 15, 1996.

[4] See Appendix I for a listing of referenced documents.

clause.[2] It is acknowledged that with this format certain Jefferson Lab documents, which serve multiple objectives of the Integration rule, will have redundant citations so that the discussion of each requirement is self-sufficient.

Rather than repeat the contents of the many documents[4] that make up Jefferson Lab's system, these documents are simply referenced wherever appropriate in this document, accompanied by a brief statement of the way each document or practice contributes to satisfying the respective requirement.

The documents referenced in the following sections of this plan were the most current ones at the time this plan was written or revised. However, it is understood that this plan will refer in the future to the most recent approved version of each document without reapproval of this plan.

II. Integration Rule and Plan

A. Definitions

(a) For the purposes of this clause,

(1) Safety encompasses environment, safety and health, including pollution prevention and waste minimization; and

All of these areas are encompassed by the EH&S Manual.[5] The EMS implemented in 2005 is an integral part of the Lab's ISMS.

(2) Employees include subcontractor employees.

The Contract,[6] in Part I, Section H, Clause H.37, Paragraph (h), requires that subcontractors be subject to the same or equivalent requirements as the Contractor.

Jefferson Lab's Environment, Health, and Safety Manual,[5] in Chapter 3420, requires that subcontractor employees performing work on site be subject to the same, or equivalent, environment, health, and safety requirements as Laboratory employees.

---

[5] Thomas Jefferson National Accelerator Facility EH&S Manual.

[6] "U. S. Department of Energy and The Southeastern Universities Research Association, Inc., Operation of the Continuous Electron Beam Accelerator Facility, Contract DE-AC05-84ER40150, Modification No. M175, November 1, 1999 to September 30, 2004," plus subsequent modifications.

B. System Principal Content

(b) In performing work under this contract, the contractor shall perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment, and shall be accountable for the safe performance of work.

The Laboratory's Contrac[6] includes this requirement in Part I, Section C, Clause C.1, Paragraphs (b)(1) and (b)(3).

Laboratory policy on Safety, Health, and Environmental Protection[7] stipulates that "Sound environmental protection, health and safety (EH&S) practices are essential elements to the successful execution of Jefferson Lab's scientific mission and all related activities. It is Jefferson Lab policy to identify and adhere to all applicable EH&S laws, regulations, standards and Department of Energy contractual commitments. Jefferson Lab considers no activity to be so urgent or important that our standards for environmental protection, health, or safety may be compromised. Demonstrated performance in protecting the environment, including a commitment to the prevention of pollution, and ensuring the health and safety of our colleagues, visitors and surrounding community is paramount among our responsibilities as a national lab."

Annual performance appraisals include a requirement for responsible environment, health, and safety (ES&H) performance.[8] This ensures accountability. In addition, violations of ES&H requirements are subject to disciplinary action.[9]

The Laboratory's contract performance measures for FY2005 contain seven performance metrics that measure important aspects of the Laboratory's ES&H performance. All of the measures are quantitative, and each has an associated goal and rating scale. The goals and rating scales are chosen to assure adequate performance. The Contract,[6] in Part II, Section I, Clause I.100, Paragraph (a)(1)(i), gives the Contracting Officer the right to terminate the Contract for default if performance requirements are not met, ensuring accountability.

The contractor shall exercise a degree of care commensurate with the work and the associated hazards.

Line management and employees in general are responsible for exercising an appropriate degree of care. Specific responsibilities are assigned in EH&S Manual,[5] Chapter 2210. The appropriate degree of care is discussed in the following three paragraphs.

---

[7] "Laboratory Policy on Safety, Health, and Environmental Protection," EH&S Manual Chapter 1100.

[8] Administrative Manual, Exhibit 208.11-1

[9] Administrative Manual, 208.01.E.13 and 208.02.

The Department of Energy has classified Jefferson Lab as a low hazard, non-nuclear, accelerator facility. [10] This classification determined the requirements present in the Contract.[6]

The Work Smart Standards[11] process evaluated the scope of work and identified the standards which, when implemented, provide a level of protection to the workers, the public, and the environment, which level has been agreed to by the DOE and SURA as appropriate.

The EH&S Manual,[5] Chapter 3210, requires that a Task Hazard Analysis be performed for each potentially hazardous task, and that the degree of care used in performing the work be commensurate with the associated risk of the unmitigated hazards. The EMS requires that environmental hazards be part of this evaluation.

The contractor shall ensure that management of environment, safety and health (ES&H) functions and activities becomes an integral but visible part of the contractor's work planning and execution processes. The contractor shall, in the performance of work, ensure that:

(1) Line management is responsible for the protection of employees, the public, and the environment.

The premise that ES&H at Jefferson Lab is the primary responsibility of line management is stated in EH&S Manual,[5] Chapter 1200. The responsibility of line management for the protection of employees, the public, and the environment is detailed in EH&S Manual,[5] Chapter 2210.

Line management includes those contractor and subcontractor employees managing or supervising employees performing work.

Jefferson Lab's Environment, Health, and Safety Manual,[5] in Chapter 3420, requires that subcontractor employees performing work on site be subject to the same, or equivalent, environment, health, and safety requirements as Laboratory employees.

(2) Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels.

Lines of authority and responsibility are defined by the EH&S Manual,[5] in Chapter 2210. Chapter 2100 provides the high-level reporting relationships. Appendix 2200-R1 identifies, by name, incumbents

[10] Memorandum dated June 2, 1993, from Wilmot N. Hess, ER-20, to James F. Decker, Acting Director, ER-1. Approved June 2, 1993 by James F. Decker.

[11] Jefferson Laboratory Work Smart Standards Documentation, James R. Boyce for the Convened Group, August 22, 1996, and subsequent changes thereto.

of key positions identified by position title elsewhere in the Manual. Supervisory relationships not shown by the organization chart or Appendix 2200-R1 are shown in the Jefferson Lab Information System Toolkit (JLIST), which is the central repository of information at the Laboratory. JLIST also shows subcontracting officer's technical representatives (SOTRs) for subcontractors. Human Resources maintain the official versions of supervisory relationships with changes input through Personnel Data Change forms.

Several committees are in place to address EH&S issues not adequately covered in the EH&S Manual. These include:

- Electrical Safety Subcommittee
- Material Handling Safety Subcommittee
- JLab Radiation Review Panel
- Emergency Management Subcommittee

These committees, which include subject matter experts representing the line divisions, report to the Director's Safety Council. A Workers Safety Committee made up of "rank and file" staff ensures that the Director is aware of floor level safety concerns.

When a situation arises in which an institutional need for creating a new position title in the EH&S Safety Area is identified, the Director's Safety Council (EH&S Manual,[5], Chapter 2240) assesses the situation and makes a recommendation to appropriate management for approval.

In addition to ensuring the integration of ES&H into work practices through clear lines of authority and responsibility (vertical integration), a number of mechanisms are used to ensure horizontal integration to the extent useful. These mechanisms include the Director's Safety Council (EH&S Manual,[5], Chapter 2240) and its subcommittees, the Emergency Management Subcommittee, the Radiation Review Panel, the EH&S Training Subcommittee, the Electrical Safety Subcommittee and the Material Handling Safety Subcommittee; Safety Warden (EH&S Manual,[5] Chapter 2210) meetings; and communications through the EH&S Reporting Manager.

(3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

As specified in the Jefferson Lab Quality Assurance Program Manual,[12] Section 2 “Personnel Qualification and Training,” Jefferson Lab hires people well qualified to discharge the jobs for which they are hired. The “Orientation for New Employees, Users, and Visitors,” EH&S Manual,[5] Chapter 4100, covers ES&H topics with which a well qualified, but new, employee might not be familiar. EH&S Manual,[5] chapters in the 32xx (xx signifies any number between 00 and 99, inclusive) series ensure that an employee and the employee’s supervisor analyze potentially hazardous tasks before performance of the tasks is begun. EH&S Manual,[5] Chapter 4200, “EH&S Training Overview,” describes the program by

[12] Quality Assurance Program Manual, Revision 6, November 2005, and Appendices.

which any additional needed training or retraining is provided before work is performed. Individual Performance Appraisals, as described in the Administrative Manual,[13] Chapter 208.11, identify any ES&H deficiencies that need to be addressed. Jefferson Lab maintains a computer-based Training Data Base which permits an employee's current training status to be compared to required training. This permits missing or expired training to be identified by people controlling access to hazardous areas. For example, the guard at the entrance to the accelerator site ensures that each person has current radiological training, or is escorted by someone who does, before permitting entry to the site. Laboratory ID badges for use with the fire protection and security system (Central Alarm Notification System - CANS) not only facilitate individual and group access throughout the Lab but also verify that appropriate EH&S training has been obtained for areas where it is required.

(4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations.

Criteria for verifying that resources are effectively allocated include meeting the requirements in Part III, Section J.5, Appendix E of the Contract,[6] successfully integrating new standards, meeting the requirements of the Necessary Set of the Work Smart Standards,[11] achieving a passing score on each of the ES&H performance measures found in Part III, Section J.2, Appendix B of the Contract,[6] closure of findings from self-assessments on reasonable time scales, and resolution of EH&S Concern Reports (EH&S Manual,[5] Chapter 2310) in a timely fashion.

Laboratory policy on Safety, Health, and Environmental Protection[7] stipulates that "Sound environmental protection, health and safety (EH&S) practices are essential elements to the successful execution of Jefferson Lab's scientific mission and all related activities."[10] Implementation of this policy requires that managers include sufficient funds in their budget requests to address ES&H needs. The EH&S Manual,[5] in Chapter 2210, explicitly requires the Lab Director to "Ensure that sufficient resources are being devoted to the maintenance of EH&S programs." The Institutional Budget, approved by the Director's Council (comprising the Director, Assistant Director, Associate Directors, Chief Information Officer, Chief Financial Officer, Chief Scientist, and Chief Technology Officer) ensures that available resources are effectively allocated to address all relevant considerations, including ES&H. In addition to the annual internal Institutional Budget allocation, the Director's Council, which meets weekly, can reallocate funds within a fiscal year, should the need arise.

Normal management practices are expected to identify areas where resources are needed to address ES&H issues, and to obtain those resources. Management self-assessments[14] examine safety issues periodically to ensure that no needs are being overlooked. To ensure that management self-assessments[14] are comprehensive and credible, they are reviewed by the Office of Performance Assurance on behalf of the Director.

---

[13] The Jefferson Lab Administrative Manual.

[14] The Jefferson Lab Management Self-Assessment Plan

Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.

The Laboratory's policy on Safety, Health and Environmental Protection quoted above states that these concern are "paramount."

The EH&S Manual,[5] in chapters 31xx, describes how ES&H considerations are addressed in planning new facilities or facility modifications and in planning and initiating experiments. Chapters 32xx describe how hazards are communicated to everyone who could be affected by them. Chapters 33xx describe different work control documents, and the conditions under which they are required. Chapters 34xx describe how ES&H considerations are taken into account in the procurement of both materials and services. Chapters 35xx describe preparations for emergencies. Chapters 4xxx describe how needed training is provided before work is performed. Chapters 6xxx describe how specific hazards are controlled during work performance.

(5) Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.

The Department of Energy's Work Smart Standards process was used to identify ES&H standards and requirements. Based upon the scope of work in the Contract,[6] an identification team comprising members of the DOE Site Office staff and the Laboratory staff analyzed the hazards and identified appropriate standards. Both legally mandated standards and standards sufficient to adequately control the hazards were included in the set developed.[11] An independent panel of experts peer reviewed the set of standards developed and agreed that it was appropriate. Rather than simply deleting the ES&H Directives in Part III, Section J.5, Appendix E following adoption of the Work Smart Standards, the Laboratory and DOE Site Office developed a Directives Review Process. In this process, each ES&H Directive was broken into separate requirements, and the requirements were classified and handled as shown in the following table:

Directives Review Process		
Category	Cases found	Disposition
Legally mandated	~585	Separate list identifying basis
Not applicable	~525	Delete
No net value added	~255	Delete
Net value added, not legally mandated	~135	Retain in Appendix E

The 135 retained requirements were consolidated where possible and were converted into performance measures where possible. The remaining requirements were added to Part III, Section J.5, Appendix E of the Contract,[6] in lieu of the ES&H Directives, and the performance measures were added to Part III, Section J.2, Appendix B of the Contract.[6] The Work Smart Standards and the legally required elements of the Directives are incorporated into the Contract[6] by reference. The DOE Site Office and Laboratory team that developed and conducted the Directives Review Process was nominated for, and received, the Vice President's Hammer Award. New directives are reviewed in the same manner.

Where standards entail requirements on many of the people involved in the work, the requirements are incorporated in the procedures in the EH&S Manual.[5] Where a standard entails requirements which directly affect only a small number of people's work, those people may rely directly on the standard or other documents, without inclusion of those documents in the EH&S Manual. This subject is addressed further in EH&S Manual,[5] Chapter 2410.

(6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards.

The EH&S Manual,[5] Chapter 3210, specifies the task hazard analysis required for potentially hazardous tasks. The level of hazard mitigation required is tailored in accordance with the risk of the unmitigated hazard. Specific administrative and engineering controls available are explained in Chapters 6xxx. These controls are used to implement standards identified in the Work Smart Standards11 process, which was used to identify the hazards at Jefferson Lab and to identify standards which, when implemented, provide a level of protection which DOE and Jefferson Lab agree is acceptable.

Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards.....

The EH&S Manual,[5] Chapter 3210, provides guidance that the first effort should be to eliminate the hazard by a change in process or material. The EMS ensures that environmental hazards are included. If the hazard cannot be eliminated, the chapter provides guidance that engineering controls are more effective and reliable than administrative controls for reducing hazards. Specific administrative and engineering controls available for each type of hazard are explained in Chapters 6xxx.

.....and to prevent accidents and unplanned releases and exposures.

Jefferson Lab's Environment, Health, and Safety Manual[5] describes its programs for preventing accidents in Chapters 61xx, 62xx, and 69xx. The programs for preventing releases are described in Chapters 6315, 67xx, and 6850. The programs for preventing exposures are described in Chapters 6310, 64xx, 6500, 66xx, 6820, and 6840. All of these chapters are used in conjunction with the chapters on policy (1xxx), organization and responsibilities (2xxx), planning for safe operations (3xxx), training (4xxx), and investigation, reporting, and record-keeping (5xxx). Included in the preventive programs are

procedures for incorporating lessons learned from accidents, near misses, and precursors (identified dangerous conditions), as described later in section C(5). In addition to direct communication of new information, procedures for updating EH&S Manual chapters are detailed in EH&S Manual,[5] Chapter 1200-T1. The effectiveness of implementation is checked and improved through the self-assessment program,[14,15] and by the contract performance measure Part III, Section J.2, Appendix B[6] results. The performance measures are reviewed annually by a joint Site Office-Lab team for effectiveness and completeness, and for appropriateness of the associated goals.

(7) The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed-upon by DOE and the contractor. These agreed-upon conditions and requirements are requirements of the contract and binding upon the contractor.

The extent of documentation and level of authority for agreement shall be tailored to the complexity and hazards associated with the work and shall be established in a Safety Management System.

The Contract,[6] in Part I, Section H, Clause H.4, Paragraph (c), and in Part III, Section J.5, Appendix E, requires the approval of the Contracting Officer before beginning work on a proposed work program and at various stages of the accelerator commissioning. Conditions and requirements to be satisfied prior to issuance of such approval are also identified in the Contract.[6] In particular, the Accelerator Readiness Review process is used to determine readiness to proceed with a subsequent phase of accelerator commissioning or operation.[16] The Final Safety Assessment Document[17] defines the safety envelope of the approved scope of work. The required documentation and the approval levels are specified in the Contract.[6]

At an internal level, potentially hazardous work is controlled through work control documents. Types of documents used, their requirements, and their approval levels are defined in the EH&S Manual,[5] Chapters 33xx. These levels are tailored to the complexity and hazards associated with the work, as identified by EH&S Manual,[5] Chapter 3210.

C. Documentation

(c) The contractor shall manage and perform work in accordance with a documented Safety Management System (System) that fulfills all conditions in paragraph (b) of this clause at a minimum.

[15] The Jefferson Lab Issues Management Procedure – Rev. 1.5

[16] CEBAF Readiness Plan, December, 1992.

[17] TJNAF Final Safety Assessment Document, Rev. 5, September, 2002. (Rev 6 is in draft)

This Plan and the documents referenced under Section (B) above comprise the documented system required by this sentence. The EMS is a part of this system.

Documentation of the System shall describe how the contractor will:

(1) Define the scope of work;

Part I, Section C, Clause C.1 of the Contract[6] defines the scope of work at the broadest level. Changes to this scope would be accomplished through contract modifications. This scope is further bounded by the Final Safety Assessment Document required by Part III, Section J.5, Appendix E of the Contract.[6]

Within the Laboratory, the scope of work is subdivided into tasks or operations by line management for purposes of hazard analysis, as specified in the EH&S Manual,[5] Chapter 3210. When appropriate, managers solicit input from ES&H professionals and/or from workers.

(2) Identify and analyze hazards associated with the work;

At the Laboratory scope of work level, hazards present at the site have been identified and analyzed through the Work Smart Standards[11] process. This process, through the Contract,[6] incorporates provisions for revising the set if the scope of work changes, if legally mandated standards change, or if certain standards are found to need improvement. In addition to a continuous, ongoing process for updating the standards, an annual solicitation of all staff for needed changes is made, and a review of the existing hazards and standards is conducted.

Within the Laboratory, hazards associated with each potentially hazardous task are identified and analyzed as specified in the EH&S Manual,[5] Chapter 3210 and by the EMS. Management self-assessments and independent assessments led by the Office of Performance Assurance evaluate the extent to which analysis of potentially hazardous tasks is performed.

(3) Develop and implement hazard controls;

When specific work control documents are required to control hazards, the development of these documents is detailed in the EH&S Manual,[5] Chapters 3310 and 3320. Other documents to control hazards are specified in Part III, Section J.5, Appendix E of the Contract,[6] such as documents for control of accelerator hazards.

Hazard controls for specific hazards are developed and implemented using procedures detailed in the EH&S Manual,[5] Chapters 6xxx. As previously stated, engineered controls are preferred to administrative controls wherever feasible.

Implementation of the controls is performed by line management, as described in the EH&S Manual,[5] Chapters 1200, 2100, and 22xx.

(4) Perform work within controls; and

Performance of work within controls is the responsibility of each employee and of line management, as described in the EH&S Manual,[5] Chapters 1200, 2100, and 22xx.

(5) Provide feedback on adequacy of controls and continue to improve safety management.

The primary feedback on the adequacy of controls, used to improve safety management, is through the self-assessment program.[14,15] Key elements of this program are individual self-assessments, management self-assessments (performed by line management), lab-level independent assessments, and performance reports. Other elements of self-assessment are provided by Accelerator Readiness Reviews, and by ES&H reviews for physics experiments. Other sources of feedback include ES&H inspections, incident/injury investigations, EH&S Concern Reports, issues submitted to the EH&S Committee, oversight provided by the DOE Site Office and other oversight agencies, audits by the SURA Corporate Auditor, and lessons learned. The roles of each of these elements are described below.

Individual self-assessments are performed annually by each staff member as part of the performance appraisal process. Any noteworthy accomplishments or need for improvement will be noted in the individual self-assessment, or in the performance appraisal performed by the supervisor.[8] The individual self-assessments and performance appraisals complement the continuous work practice required by Jefferson Lab policy[7] for all individuals to be "... responsible for establishing knowledge and control of the EH&S hazards of all work in which he or she participates. Everyone has the right and responsibility to remedy or report--without fear of reprisal--any practice, situation, or action which endangers people or the environment." Alternative methods of meeting this policy requirement are detailed in EH&S Manual,[5] Chapter 2310.

Management self-assessments[14], performed by line managers throughout the Laboratory, take a detailed look at a particular EH&S topic (*e.g.* personal protective equipment. electrical safety, *etc*.). These self-assessments note and provide plans for improving ES&H where needed or where the opportunity exists. Management self-assessments focus on whether appropriate leadership and support systems are provided to enable the safe implementation of work processes, and to ensure that human and material resources are being properly utilized to achieve the Lab's mission and objectives. This level of self-assessment complements continuous management and oversight.

Lab-level independent self-assessments are led on an ongoing basis by the Office of Performance Assurance. This group is independent of the work processes being assessed. Findings and recommendations from these assessments are provided to line management for corrective action. This level of self-assessment emphasizes the technical elements that impact work processes to determine the ability of the Lab to continuously meet all requirements and expectations.

Corrective actions from internal and external reviews and assessments are tracked to completion in the Laboratory's web-based issues management system, CATS (Corrective Action Tracking System), in accordance with an Issues Management Procedure[15] approved by Director's Council. The Office of Performance Assurance reports to the Director's Safety Council periodically on the status of outstanding corrective actions.

Performance reports are produced twice annually by senior management based on the results of the contract performance measures. The annual performance report is formal and documented, and the mid-year performance report is informal and undocumented, but results in corrective action where appropriate. In both cases, reasons for exceptionally good or poor performance are identified, and corrective action is initiated where appropriate.

Accelerator Readiness Reviews[18] examine the status of training, documentation, and hardware, identify any ES&H deficiencies, and require correction of the deficiencies before or during operation, depending on their seriousness.

ES&H reviews for CEBAF physics experiments and FEL experiments are performed for each physics experiment before it is permitted to begin operation (EH&S Manual,[5] Chapter 3120). These reviews include environmental aspects of the experiments. Any deficiencies are corrected or mitigated.

ES&H inspections, as described in the EH&S Manual,[5] Chapter 5100, are performed on a regular basis by each of the three Divisions. Every area is inspected at least quarterly. Any frequently occurring deficiencies, any deficiencies which are not corrected within a reasonable time frame, or any unexpected types of deficiencies result in corrective action by management.

Incident/injury investigations, as described in the EH&S Manual,[5] Chapter 5200, can identify procedures which do not adequately control hazards, in which case improved procedures are developed.

EH&S Concern Reports, as described in the EH&S Manual,[5] Chapter 2310, can be filed by anyone working at Jefferson Lab. The same chapter describes the method of addressing the concern; this method may include improvement to safety procedures.

[18] Contract, Appendix E, Accelerator Facility Operations Requirements, Section 4.

Anyone at Jefferson Lab can submit an issue to their supervisor or Associate Director, the Workers Safety Committee, the Director's Safety Council or its subcommittees, which are described in the EH&S Manual,[5] Chapter 2240. If the Council determines that an improved procedure is appropriate, it will recommend the improvement to line management for approval and implementation.

Because imminent dangers require immediate action, everyone at JLab, staff, students subcontractors, and users, has the right and duty to issue a stop work order if he or she observes a hazard which is likely to cause death, serious injury, significant property damage or environmental impairment.

The DOE Site Office maintains constant familiarity with activities at the Laboratory, and participates in some inspections. Feedback from the Site Office is useful for improving ES&H procedures at the Laboratory.

Audits by the SURA Corporate Auditor are focused on ES&H issues one to two times per year. Recommendations are useful to line management for improving ES&H procedures.

Lessons learned and DOE ORPS reports are reviewed by the EH&S Reporting Manager, as described in the EH&S Manual,[5] Chapter 5300. Lessons learned may be from either accidents or near misses, and from either Jefferson Lab or other facilities. If likely to be applicable to Jefferson Lab (for external lessons), or to work groups other than the one in which they originated (for internal lessons), the EH&S Reporting Manager provides relevant information to appropriate line management. Both internal and external lessons of interest are available on the Laboratory web site.

D. Maintenance of System Integrity

(d) The System shall describe how the contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System.

Part I, Section C, Clause C.1 and Section H, Clause H.37 of the Contract[6] define the process for establishing, documenting, and implementing safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System. A Contract Implementation Steering Committee, with members from the Site Office, the Laboratory, and the Contractor’s headquarters office has been formed to oversee this process. An ES&H Performance Measure Subcommittee has been formed to propose performance measures, or modifications to existing performance measures, to the Contract Implementation Steering Committee, which in turn proposes them to the Contracting Officer and the President of SURA for incorporation into the Contract. The ES&H Performance Measure Subcommittee comprises two members from the Site Office and two from the Laboratory. Performance measures and their grading scales are selected to

measure all important aspects of the Laboratory's performance without providing an incentive for any undesirable modes of operation. Quantitative measures are selected. The weighting of each performance measure is tailored to its relative importance, but adequate scores on all performance measures are necessary to demonstrate good overall performance. Where possible, measures are selected whose results can be compared to other DOE facilities or to industry. Goals are established which are not easily achieved, and are equated to the 100% point on the grading scale.

The System shall also describe how the contractor will measure system effectiveness.

Part III, Section J.2, Appendix B of the Contract[6] stipulates that the Contractor will perform an annual evaluation[4] of the results of the contract performance measures, plus other significant topics which may not be adequately addressed by the performance measures. Any differences between what the results of the measures appear to signify and what they actually signify are discussed in the resulting report. Any such differences may lead to a change in either the performance measure itself, or in the grading scale associated with the performance measure. It has been recognized that performance measures associated with environment, health, and safety, due to the small numbers of undesirable events, are subject to statistical fluctuations.

Aspects of system effectiveness which are not suitable for performance measures, such as yes-no questions, are covered primarily through the self-assessments.

E. DOE Approval

(e) The contractor shall submit to the contracting officer documentation of its System for review and approval.

This Plan acknowledges the requirement for its submission to the Contracting Officer for review and approval.

Dates for submittal, discussions, and revisions to the System will be established by the contracting officer. Guidance on the preparation, content, review, and approval of the System will be provided by the contracting officer. On an annual basis, the contractor shall review and update, for DOE approval, its safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction.

The Contract Implementation Steering Committee reviews the safety performance objectives and performance measures on an annual basis, for DOE approval. Since Jefferson Lab is a relatively new lab with no significant environmental legacy, the review and update of commitments consistent with and in response to DOE's program and budget execution guidance and direction has not been an issue.

Jefferson Lab does not foresee the need to adjust commitments in the future, but, should such a need arise, it would be addressed by the Contract Implementation Steering Committee.

Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as maintain the integrity of the entire System. Accordingly, the System shall be integrated with the contractor's business processes for work planning, budgeting, authorization, execution, and change control.

Resources are identified in the Institutional Budget. This budget, approved annually by the Director's Council, is based upon bottom-up budgets submitted by individual cost account managers, and thus includes adequate funding to meet safety objectives and performance commitments, as well as maintain the integrity of the entire System. This budget is iterated to be consistent with the resources provided by the DOE. The amount of running time for the accelerator, which is not an ES&H issue, is adjusted to accommodate variations in the resources provided by the DOE. Each cost account manager is authorized to proceed with the execution of the work covered by that cost account, but is not authorized to exceed the allocated budget for that account without obtaining additional funds. This work authorization is subject to approval of any required documents specified in Chapter 33xx of the EH&S Manual,[5] and to meeting other requirements of the EH&S Manual, plus accelerator directives and other requirements in the Work Smart Standards set and in Part III, Section J.5, Appendix E of the Contract.[6] During a major construction project, change control is used to approve changes in scope, cost, and/or schedule for the construction project. Changes of funds from Operating or other funds to General Plant Project funds, in the event insufficient General Plant Project funds are included in the original DOE allocation to satisfy ES&H needs in that area, require DOE Headquarters approval.

F. Compliance

(f) The contractor shall comply with, and assist the Department of Energy in complying with, ES&H requirements of all applicable laws and regulations, ...

The Contract,[6] in Part I, Section C, Clause C.1, Paragraph (b)(3)(v); Part II, Section I, Clause I.90; Part I, Section H, Clause H.37; and Part II, Section I, Clause I.27, Paragraph (b)(1), provides this requirement. The contractor is required to comply with all applicable Federal and non-Federal ES&H laws and regulations whether identified by the Department or not.

.....and applicable directives identified in the clause of this contract on Laws, Regulations, and DOE Directives.

The Contract,[6] in Part I, Section H, Clause H.37, requires Contractor compliance with the "necessary" requirements of the Work Smart Standards set,[11] and with the ES&H-related requirements in Part III, Section J.5, Appendix E of the Contract.[6]

The contractor shall cooperate with Federal and non-Federal agencies having jurisdiction over ES&H matters under this contract.

The Contract,[6] in Part I, Section H, Clause H.30; Part I, Section H, Clause H.37, Paragraph (a)(8); and Part II, Section I, Clause I.74, Paragraph (f), requires Contractor cooperation with Federal and non-Federal agencies having jurisdiction over ES&H matters.

G. Resolution of Noncompliance

(g) The contractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System.

The Laboratory uses the normal line management chain, the EH&S Concern Resolution process (EH&S Manual,[5] Chapter 2310), and EH&S Committees (EH&S Manual,[5] Chapter 2240) to promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System. If a noncompliance is complex, the independent Office of Performance Assurance may be asked to perform an evaluation of the situation and identify possible resolutions.

If the contractor fails to provide resolution or if, at any time, the contractor's acts or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public, the contracting officer may issue an order stopping work in whole or in part.

This requirement appears in Part I, Section H, Clause H.37, Paragraph (i) of the Contract.[6]

Any stop work order issued by a contracting officer under this clause (or issued by the contractor to a subcontractor in accordance with paragraph (i) of this clause) shall be without prejudice to any other legal or contractual rights of the Government.

This requirement appears in Part I, Section H, Clause H.37, Paragraph (i) of the Contract.[6]

In the event that the contracting officer issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the contracting officer.

This requirement appears in Part I, Section H, Clause H.37, Paragraph (i) of the Contract.[6]

The contractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

This requirement appears in Part I, Section H, Clause H.37, Paragraph (i) of the Contract.[6]

H. Extent of Contractor Responsibility

(h) The contractor is responsible for compliance with the ES&H requirements applicable to this contract regardless of the performer of the work.

This requirement appears in the Contract[6] in Part I, Section H, Clause H.37, Paragraph (h).

I. Flow-down of Requirements

(i) The contractor shall include a clause substantially the same as this clause in subcontracts involving complex or hazardous work on site at a DOE-owned or -leased facility. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) of this clause.

Requirements for the flowdown of ES&H requirements to subcontractors performing on-site work appears in the Contract[6] in Part I, Section H, Clause H.37, Paragraph (h). These requirements are reflected in Jefferson Lab's EH&S Manual,[5] in Chapter 3420. This plan acknowledges the requirement for insertion of a clause into subcontracts substantially equivalent to the "Integration of Environment, Safety and Health into Work Planning and Execution" clause when such subcontracts involve complex or hazardous work on site at a DOE-owned or -leased facility.

Jefferson Lab's EH&S Manual,[5] Chapter 3330, requires that Subcontracting Officer's Technical Representatives (SOTRs) have the authority to stop work immediately if the subcontractor's actions are causing imminent danger. Chapter 3420 provides procedures for dealing with persistent noncompliances which do not cause imminent danger. These Manual chapters are reflected in procurement practices.

Depending on the complexity and hazards associated with the work, the contractor may require that the subcontractor submit a Safety Management System for the contractor's review and approval.

The requirement for a subcontractor to submit, for approval, a Safety Management System Plan appears in Chapter 3420 of the EH&S Manual,[5] and was adopted as a procurement practice on June 11, 1997. This requirement is subject to thresholds which depend on the hazards involved and on the size of the contract.

Appendix I: Referenced Documents

TJNAF Final Safety Assessment Document, Rev. 5, September, 2002 (Rev 6 is in draft)

CEBAF Readiness Plan, December, 1992

DOE P 450.4, dated October 15, 1996

Federal Register, June 27, 1997 (Volume 62, Number 124), page 34841

"Integration of Environment, Safety and Health into Work Planning and Execution," which is required by a modification to Department of Energy Acquisition Regulation 48 CFR 970.5204-2

The Jefferson Lab Issues Management Procedure – Rev. 1.5

The Jefferson Lab Management Self-Assessment Plan

Jefferson Laboratory Work Smart Standards Documentation, James R. Boyce for the Convened Group, August 22, 1996

Memorandum dated June 2, 1993, from Wilmot N. Hess, ER-20, to James F. Decker, Acting Director, ER-1. Approved June 2, 1993 by James F. Decker

Quality Assurance Program Manual, Revision 6, November 2005, Section 2. This manual is reviewed annually to determine whether or not changes are needed. Frequently- changing information is published in the Quality Assurance Program Manual Appendices.

U. S. Department of Energy and The Southeastern Universities Research Association, Inc., Operation of the Continuous Electron Beam Accelerator Facility, Contract DE-AC05-84ER40150, Modification No. M175, November 1, 1999 to September 30, 2004,as subsequently modified

Part I
- Section C
  - Clause C.1
    - Paragraph (b)(1)
    - Paragraph (b)(3)
    - Paragraph (b)(3)(v)
- Section H
  - Clause H.4

Paragraph (c)
Clause H.30
Clause H.37
Paragraph (a)(8)
Paragraph (h)
Paragraph (i)
Part II
Section I
Clause I.27
Paragraph (b)(1)
Clause I.74
Paragraph (f)
Clause I.90
Clause I.100
Paragraph (a)(1)(i)
Part III
Section J
Appendix B
Appendix E

The Jefferson Lab Administrative Manual
Chapter 208.01.E.13
Chapter 208.02
Chapter 208.11
Exhibit 208.11-1

Thomas Jefferson National Accelerator Facility EH&S Manual
Chapters 1xxx
Chapter 1100
Chapter 1200
Appendix 1200-T1
Chapters 2xxx
Chapter 2100
Chapters 22xx
Appendix 2200-R1
Chapter 2210
Chapter 2240
Chapter 2310
Chapter 2410
Chapters 3xxx

Chapters 31xx
Chapters 32xx
Chapter 3210
Chapters 33xx
Chapter 3310
Chapter 3320
Chapter 3330
Chapters 34xx
Chapter 3420
Chapters 35xx
Chapters 4xxx
Chapter 4100
Chapter 4200
Chapters 5xxx
Chapter 5100
Chapter 5200
Chapter 5300
Chapters 6xxx
Chapters 61xx
Chapter 6110
Chapters 62xx
Chapter 6310
Chapter 6315
Chapters 64xx
Chapter 6500
Chapters 66xx
Chapters 67xx
Chapter 6820
Chapter 6840
Chapter 6850
Chapters 69xx

Independent Assessment and Management Self-Assessment Procedures